

**What is claimed is:**

1. A method of identifying oil-associated genes in maize comprising
  - (a) establishing a random mated population of maize plants derived from crossing the Illinois high oil line with the Illinois low oil line,
  - 5 (b) identifying candidate oil genes,
  - (c) identify oil informative SNP markers having an allelic frequency difference of at least 0.6 between the Illinois high oil line and the Illinois low oil line and linked to said candidate oil genes,
  - (d) identify kernel oil levels in said population,
  - 10 (e) genotype said population based on said oil informative markers,
  - (f) conduct an analysis of association between said oil informative markers and said kernel oil levels to establish a statistical significance level,
  - (g) select as oil genes those candidate genes linked to a marker having a statistical significance of greater than 0.05.
- 15 2. A method of claim 1 wherein said SNP markers are linked to markers mapped in Table 2.